

A JOURNEY ON THE SEMBRONG RIVER.

From Kuala Indau to Batu Pahat.

BY H. W. LAKE AND H. J. KELSALL, R.A.

Personal Account of the Journey.

The party, consisting of Mr. Lake and myself, with a native surveyor and native bird and plant collectors, left Johor Bahru in the launch Pulai on the 15th October, 1892, and that evening anchored at Tanjong Surat at the mouth of the Johor river.

Getting under way at 6 a.m. the following morning, we reached Tanjong Tingaroh, about 70 miles up the east coast of Johor, shortly before nightfall.

Here Mr. Lake went off in a dingy to make a rapid survey of the small river Tingorah, which enters the sea just south of the point, while I went ashore to collect. On the rocks at the end of the cape were quantities of Orchids, the most conspicuous being *Cirrhopetalum Medusæ*, *C. concinnum* and the common Pigeon Orchid (*Dendrobium*).

The only birds I noticed were a single large heron (*Ardea Crumenatum*) some terns, green pigeon and the common little king fisher (*Alcedo ispida*).

Early the next day the Pulai steamed into Kuala Indau under the pilotage of a piratical-looking old Malay whom we picked up outside the bar with which this river, like all these on the east coast of Malaya, is furnished.

Here we all disembarked and while Mr. Lake was making arrangements for boats, etc., for the journey up the river, I went forth in search of spoils, zoological and botanical, but met with but little success.

In a steep of jungle near the sea, I found a fine tree of a wild durian (*Durio*) loaded with its beautiful crimson fruit, and on the river-bank a small bed of the reed (*Phragmites roxburghi*). The only Mammal I saw was a Wau-Wau or Ungka of the black variety with white hands (*Hylobates albimanus*, Vig. and Horsf.)

The river near its mouth describes almost a complete circle, forming a peninsula of several miles diameter which is connected with the mainland by a neck barely quarter of a mile across; so, having procured a large boat or skuchi and loaded it up with our baggage we sent it off early in the afternoon to meet us some hours later at the other side of this neck, when after cooking and eating our evening meal on the river bank we proceeded up stream. A halt was made from midnight till 3 a.m., on account of the tide which was then running down very strong, and we reached Kuala Sembrong at 10 a.m., on the 17th October.

The river up to this point is broad and deep, and the banks in many places are lined with dense beds of "Rasau," a slender almost unbranched pandan with small leaves, which grows to a height of 15 or 20 feet.

For some miles from the Kuala the water of the river was phosphorescent where disturbed by the paddles. In the bushes along the banks were swarms of the small "fire-fly" (a small yellow beetle) which abounds in mangrove swamps and which extinguishes and relights its tiny lamp with such regularity that a swarm of them often have the appearance of concerted action, all the individuals composing it extinguishing and relighting their lamps at the same moment as if actuated by clock-work.

The little Malayan hornbill (*Anthracoceros convexus*) is common in this district, and we noticed several Rhinoceros hornbills (*Buceros rhinoceros*). The former always goes in flocks of from three or four up to as many as eight or ten, the latter usually in pairs.

The country from Kuala Indau up to Kuala Sembrong is perfectly flat and covered with dense uninhabited jungle, of which perhaps the most striking feature is the abundance of rotans of various species, the most conspicuous along the river banks being "Rotan S'ntawa."

On the 19th October, leaving the bird collector and one plant collector with the bulk of the baggage at the police station at Kuala Sembrong and taking sufficient provisions for three

days, we continued up the Indau in order to ascend Gunong Janeng and explore the rivers Mas and L'makan.

After poling for about two hours and a half we passed Kuala Mas on our left and five hours later, about 4 p.m., the Jakun clearing just below Kuala L'makan came in sight. For some miles below this place the river had been gradually becoming shallower and we found that the skuchi could proceed no farther. The character of the jungle bordering this part of the river is somewhat different to that along the lower reaches. The Rasau beds grow fewer and at last disappear and the river banks increase in height and are in places covered with dense brakes of fern (*Gleichenia linearis*) and in others with bamboos of different kinds.

At Kuala L'makan, there is a considerable Jakun settlement, all however, on the Johore side of the river, the Jakuns objecting to live on the Pahang side as they say they suffer ill-treatment at the hands of the Pahang Malays. This settlement has been in existence about a year and a half, before which time the families composing it lived some miles higher up at Batu Gajah, but owing to several of their number being killed by tigers they migrated to their present locality. One woman was actually pulled through the bamboo flooring of a hut and carried off by a tiger.

This is the only settlement of those we visited, with the exception of that on the Mas river, where the natives manufacture spear-heads, and other iron articles. They obtain the iron from Malay or Chinese traders and work it up for themselves, and supply the other settlements on the Indau and its tributaries,

The forge used by the Jakuns is very simple in its construction. It consists of a clay basin, about 18 inches in diameter, at one side of which enters a nozzle of hard wood which is connected with a hollow wooden cylinder about four feet long and six or eight inches in diameter in which works a piston and which serves as a bellows.

Having interviewed the Penghulu of the district who was living at this place; and arranged for small "jalors" (dug-outs) in which to carry out the exploration of the smaller streams we spent the evening obtaining "Pantang Kapur" vocabulary.

On the following day Mr. Lake started off early in a small jalor to make a survey of the L'makan river while I accom-

panied by the plant collector, Mat, and the native surveyor, Pillai, with a theodolite, went up stream to ascend Gunong Janeng with a view to obtain some additional bearings by which to fix the position of the mountain.

Above Kuala L'makan the country gradually becomes more hilly as it rises to the mountain district of which Berembun is the highest point and which includes mount Janeng. After three hours poling I reached the foot of Janeng and commenced the ascent. Near the foot of the mountain I noticed some fine Hibullpalms (*Orania macrocladus*). The whole of the ascent is steep, in parts precipitous for a short distance. The undergrowth on the lower slopes is almost wholly composed of a forest of B'rtam (*Eujeissona tristis*) a very thorny palm, the leaves of which are used for atap. It occurs in considerable quantities right up to the summit.

On the summit, which is about 2,000 feet above sea level, and which I reached in two hours, is a small clearing which was made about 18 months previously by Mr. Lake for the purpose of taking bearings, and as soon as the theodolite arrived I set it up and took one or two bearings but owing to the cloudiness of the weather not very satisfactorily.

From the summit a pretty extensive view can be obtained, including Gunong Blumut and the plain of the Indau Sembrong on the one hand and Gunong Berembuan with the coast line from some distance north of Kuala Rumpa to a little south of Kuala Indau and Pulau Tioman on the other.

Pillai made a "field book" survey of the path followed, and Mat got a good bookfull of specimens. On and near the summit quantities of Daun Payong (*Teysmannia altifrons*), a large-leaved almost stemless palm, much used by the Jakuns in the construction of their huts were growing; also a species of pandan called 'Jakas' by the Jakuns. I also saw a troop of 'Beroks' (*Macacus nemestrinus*) and at the foot of the hill fresh tracks of elephants. I also heard the cry of an argus pheasant and found one of the dancing grounds of this bird, a small space two or three yards square carefully cleared of all plants, twigs, and dead leaves.

About 2.30 p.m. it commenced to rain heavily and continued all the afternoon and night. On the way back to camp at Kuala L'makan I obtained specimens of the beautiful ground orchid *Arundia speciosa*, Bl., P'hanyir of the Jakuns.

The lovely dragon fly which in one light reflects the most brilliant peacock blue and in another the brightest of greens, was very common on this part of the river.

The next morning before returning to Kuala Sembrong I saw a Jakun go through the process of producing fire by means of a 'darāk,' or fire stick. He took a piece of bamboo, about 15 inches long and $\frac{1}{2}$ an inch in diameter, into one end of which he fixed, by means of rotan lashing, a small piece of hard wood 2 or 3 inches long and of the same diameter as the bamboo. He then made a small nick in another piece of wood of the same kind as that fixed in the bamboo (in this case an old parang handle was used), which he held firm with his foot and placing the point of wood which was fixed in the bamboo into this nick he twirled the bamboo rapidly between his hands like a drill until the fine dust ground away by the friction was ignited by the heat produced. This tinder was then blown into a flame with some dry leaves.

I reached Kuala Sembrong about 1 p.m., and Mr. Lake arrived from Sungei Mas a few hours later, having explored the L'makan and Mas rivers.

On the latter river are two villages, in one of which Mr. Lake noticed a large tom-tom, consisting of a hollow cylinder of wood, a foot in diameter and about 3 feet long, the ends of which were covered with black monkey skin, also several smaller ones. He also saw some Genggongs, a kind of jew's harp, made of the wood of the 'Lankap' palm, (*Arenga obtusifolia*) and a few apparently disused sumpitans of very inferior workmanship. There was also at this place a forge similar to the L'makan one and bliongs and spear heads are made.

In these villages were several lepers, the disease having been brought, it was said, from the Jakuns of the Rumpen river in Pahang.

The following day (22nd Oct.) Mr. Lake went off in a small jalor to explore the Linggor river, while I remained at Kuala Sembrong in the hope of getting some observations for magnetic variation, but owing to clouds was unable to do so.

Our bird collector Marie having shot a large hornbill, 'hornbill steak' was added to our bill of fare for the day and made a very welcome variation in the daily routine of rice, salt-fish and curry. The flesh of the hornbill, which is almost

entirely a fruit eater, is very good eating, steaks off the breast somewhat resembling beef steak. On the 23rd the journey up the Sembrong was commenced. The country here continues of the same low swampy nature as on the lower Indau, and although one or two abandoned clearings were passed, not a sign of a hut or a human being was discovered. There was heavy rain again during the afternoon and at night.

The next morning on the way up stream we met a Jakun, going down in a small jalor, who told us that Che Ma Hassain, the Penghulu of the Kahang district was some distance down stream with a party of his Jakuns collecting rotans, and as we were more or less dependent upon his assistance in getting boats and men we sent a man back with a letter which we had for him.

We reached Kuala Kahang at 9 a.m. and having fixed on a site for a camp set our men to work to construct 'pondoks' or huts, to shelter ourselves and our stores. This work did not take long, as the natives, both Malays and Jakuns, are used to constructing these rude shelters on their journeys through the jungle in search of rotans, etc.

The Kahang is a rapid stream, showing by its current that it takes its rise in the mountains, and contrasting with the Sembrong which, taking its rise and flowing for the greater part of its course through swamps, is very sluggish.

During the day a Chinaman who had come over from the Batu Pahat side passed down the Sembrong, and from him we obtained some information concerning the route, and a little later there arrived a small jalor containing a Dyak, his wife and two children, and a Jakun who were going up the Kahang. From this Dyak we learned that there was a small Dyak settlement near Kuala Madek, a few miles up the Kahang consisting of himself and four or five other Dyaks, who had been there for six years. He told us that the Jakuns now settled at Kuala Madek had come there two years previously from the Lenggu river. The under growth in the near neighbourhood of our camp consisted almost entirely of a small rotan which made bird and plant collecting very difficult work.

As we intended to explore the Kahang, and Madek rivers, the former of which had not previously been ascended by a white man, we sent off some of our men to hunt up small jalors at the villages up stream, in which we could make the ascent of

these rivers, and were fortunate in procuring several to select from, and on the 26th October we started.

Mr. Lake went up the Kahang, taking with him a plant collector. This river is, after passing the village of P'niot, quite uninhabited. The jungles through which it flows are, however, the favourite hunting ground for the camphor seekers, especially in the neighbourhood of Bukit B'bap (Jakun—a frog) a hill about 800 feet high and shaped somewhat like an inverted basin.

Rotans are also very abundant, although not of the best kind. Mr. Lake met one party of Jakuns and another of Malays collecting rotans. He also saw several camphor trees. One night the "Bisan Kapur" or spirit of the camphor tree was heard, which the Jakuns declared was a sure sign that there were camphor trees close by and sure enough on search being made the following day trees were found. This "Bisan Kapur" is one of the Cicadas, of which many species abound in the jungle, each one of which makes its own peculiar sound. The Jakuns who were with Mr. Lake secured a fine specimen of a tortoise, called by them "Binku."

After two days continuous hard work, poling and dragging the jalors over fallen trees, the river became extremely narrow and completely overhung with jungle and the surrounding country once more became very swampy. Two more days were spent by Mr. Lake retracing his course to Kuala Kahang he having mapped about twenty miles of the river.

While he was exploring the Kahang I went up the Madek for a short distance to collect such information as was possible about the Jakuns on that river.

A short distance up the Kahang, at Tanjong P'nting, there is a small settlement of Jakuns. The banks of this river rapidly get higher and steeper and the jungle becomes less swampy. On one tree overhanging the river I saw a plant of the fine orchid *Grammatophyllum speciosum* and on many of the trees was growing a large epiphytic pandan called by the Jakuns "pandan lari."

About two houses after leaving Kuala Kahang I passed the mouth of the Madek but, as this river is much encumbered with fallen trees, it was necessary to continue for some miles up the Kahang to a place a little above the large Jakun village called

P'niot, where there is a curious narrow tortuous channel or "trusan" called Kahang Kudun, which connects the Madek with the Kahang and is in fact a branch of the former river. It took twenty minutes to pass from the Kahang to the Madek which is a narrow stream much encumbered, as previously stated, with fallen trees. Up this stream I proceeded some miles, when, learning from the Jakun boatmen that there were no more villages further up stream, I decided to return to Kampong P'niot, which I reached about 4 p. m.

This settlement has been in existence about a year, the inhabitants having previously lived at Hulu Madek for six years. It seems that these Jakuns move from place to place in the Indau and Sembong districts, but seldom or never cross over to the western side of the watershed, though one instance of such a migration was met with at Londang on the Hulu Sembrong, but this was an exception. These people settle down in one place, make a clearing and plant hill padi (of which they usually obtain but one crop), "jagong," or maize and plantains, and remain till the ground is pretty well worn out or till they have exhausted the stock of rotans and getah in the neighbouring jungles, when they move to another locality and repeat the same operations. Crocodiles were said to occur in the Kahang river and we saw the grave of a man who had been killed by one a short time previously but we never saw any ourselves.

I remained camped at Kampong P'niot for three days until Mr. Lake's return from Hulu Kahang and spent most of the time collecting "Pantang Kapur" vocabulary. The day after my arrival the "Batin," or head man of the village, Pasooah by name, came down stream from Hulu Madek, where he had been with some of his men looking for rotans. This man is a "Penghulu Kapur," as they call any man who is more clever than others at finding camphor and from him I learned a large number of words. The common wau-wau, or Ungka (*Hylobates albi-manus*) was plentiful in the jungle here but no specimens were obtained. The common black lotong (*Semnopithecus obscurus*) was also met with in numbers and I got several specimens. Birds were not very numerous, but one new record for the Malay peninsula, viz., the fork tailed drongo (*Diamus macrocercus*) was secured.

On the 30th October we struck our Kuala Kahang camp and started for Hulu Sembrong. Soon after leaving Kuala Kahang the river narrows up very rapidly and after passing Kuala Harus, daas, is only about fifteen yards wide. For some miles above this point the river is split up into a number of small channels, that which we followed being only a few yards wide, and much overhung with jungle, so that progress was slow. After passing the point where the B'hai separates from the Sembrong the latter becomes deeper and wider again, being as much as thirty or forty yards in width. Here I noticed a number of a nibong-like palm which the jakuns called "Bayas" (*Oncosperma horrida*.) About here too the Rotan S'ntawa, which is so common on the lower reaches of the river, gives place to another species, viz., Rotan Sabut (*Calamus hystrix*), which is larger leaved, exceedingly thorny and of less value than Rotan S'ntawa.

The next halt was at Kampong S'lieh, a small Jakun settlement with about twenty to thirty inhabitants. They had been at this place only a few months, some having come from Tanjong P'nting and some from Hulu Sembrong. They had made a large clearing planted with tapioca, sugarcane, and pine-apples and a small quantity of tobacco, apparently in a flourishing condition. A tiger, or tigers, had visited this village a few days before our arrival and carried off several dogs.

On the following day (31st October) the journey up stream was continued. Very soon the river again split up into innumerable narrow channels flowing through thick swampy jungle scarcely raised above the level of the river. In many places there was only just sufficient room for the boats to pass between the overhanging foliage, and a sharp look out had to be kept for the ever ready "onak," as the long projecting well armed shoots of the rotan are called. The large buff-breasted, orange-billed Kingfisher (*Pelargopsis Ma'arcensis*) here usurps the place of the Black-capped Kingfisher (*Halcyon pileata*) which holds sway over the finny denizens of the lower waters, while the little Kingfisher (*Alcedo ispida*), the same species which occurs in England, lives apparently on the best of terms with both.

At one place it was necessary to cut through a newly fallen tree which lay across the river.

During the day we passed the mouth of the S'lai, which can be ascended, it is said, for three or four days in large jalors. The source of this river is in the hills near Hulu Indau and there is in that district a considerable Jakun settlement.

About an hour after passing the S'lai all the small channels reunited and the river once more became of a respectable size at Kuala Tamok. There is a Jakun settlement a short distance up this river. From this point there is a succession of beautiful reaches, each several hundred yards long and 60 to 70 yards wide, and the neighbouring country becomes more hilly; then comes a chain of "Palohs" or lagoon like expansions of the river, each several hundred yards long and 100 to 250 yards wide. These Palohs are full of Rasau Bakong (*Susum anthelminticum*) and other swamp plants, and have a very picturesque appearance. After an hour and a half of easy and rapid progress through these fine open reaches the channel suddenly narrowed for a short distance to three or four yards and then widened out again, and soon the fine open reach at Pengalen Panau, where a Chinaman and a few Jakuns live, was reached.

Here a short halt was made to talk to Inche Krani, a Penghulu who was collecting specimens of Damar, woods, &c., for the Chicago exhibition.

About half an hour after leaving this place the river once more became a labyrinth of narrow channels which it took us two hours and a half to traverse and then we came to the last open reach just below Londang, where we camped for the night.

This place is the head quarters of the Penghulu, Che Ma Dajang, and there had been here a considerable Jakun settlement but some months previously they migrated to the Batu Pahat Sembrong on the western side of the watershed.

The only animals noticed during this part of the journey were black lotongs, which are very common in these jungles, and a few birds, including a small parrot (*Psittacus incertus*) and a Drongo called by the Jakuns "T'ntong," from its note which consists of the syllables "T'ntong" in falling cadence; some hornbills were also seen. The next day (1st Nov.) we continued our journey up stream. The river is very narrow from here up to its source and consists of a net work of "trusan" or narrow channels, meandering through a flat swampy country in which

the fine pandan called by the Jakuns Mengkuang tikar (*Pandanus furcatus*) and which is used for making kajangs, &c., grows plentifully. This pandan attains a height of 20 or 30 feet and its leaves are 10 to 15 feet in length and three or four inches wide. There was also a quantity of a palm resembling B'rtam and called by the Jakuns K'lûbi (*Zalacca Sp.*) It has an acid fruit about the size of a pinang nut but round and of a reddish colour which can be eaten when boiled, according to the natives' account.

About noon the survey trace of the proposed railway from Johor Bahru was crossed at a point 57 miles from that town, and about half an hour afterwards, just below Pengkalan Repoh, the shallowness of the river and a fallen tree put a stop to our further progress. Only the very smallest jalors can proceed some little distance beyond this point, where the river is only 10 or 12 feet wide. A few Jakuns were camped at this place having come from Simpai, on the Batu Pahat Sembrong, to fish.

The next two days were occupied in transporting all our baggage across the five miles which separates Pengkalan Repoh from Kampong Simpai, the highest navigable point on the Batu Pahat Sembrong.

About two hours after leaving camp Mr. Lake and I, who went first, reached the point on the Panggong mentioned by Mr. Hervey in his account of the Indau and its tributaries, where that stream bifurcates, one portion flowing to the north west and becoming the Klambu, which unites with the Simpai to form the Batu Pahat Sembrong, the other flowing north east to join the M'liher.

Another hour and a half's tramping through the jungle, along the well-worn footpath which forms the highway between the eastern and western Sembrongs, brought us to Simpai. At this place are settled a few Malays and a considerable number of Jakuns. As it was uncertain whether boats would be at once procurable in which to proceed to Batu Pahat, a 'pondok' was built and a camp established on the river bank. In the evening I shot a specimen of the red flying squirrel (*Pteromys oral*): it was espied by one of the Jakuns, running up a tree close to the camp, and pointed out to me. A few new Pantang Kapur words were added to the vocabulary at this place.

The last of the baggage did not arrive till the afternoon of the 3rd Nov. and Che Ma Hassain did not leave us till he saw everything brought into camp. The conduct of this Penghulu cannot be too highly spoken of. All the Malay Penghulus and headmen with whom we had any dealings were with one or two exceptions most civil and obliging, giving every assistance in the way of men and boats, but Che Ma Hassain surpassed them all, coming much further than his duty required in order to save us trouble with the men and to see that we had every facility for carrying out our plans. In manners and bearing he was a perfect gentleman. Leaving our plant and bird collectors at Simpai, we started on the 4th Nov. down stream in two medium-sized jalors and after two hours poling reached Cheh Cheh where we changed into a large jalar. On our way we saw a fine specimen of the banded viper (*Bungarus fasciatus*) in a hole in the bank. On an attempt being made to kill it, it took to the water and by diving escaped. Just after leaving Cheh I shot a specimen of the beautiful little dark purple kingfisher (*Alcedo meninting*) and shortly afterwards two specimens of a curious and very prettily coloured fringed lizard.

The jungle gradually became more and more swampy as we proceeded, until we reached a part where for miles the forest bordering the river grows apparently in the water, there being scarcely any dry ground visible. There appeared to be a good many orchids in this place; then comes a stretch of Rasau swamps and here we noticed the Kinta weed (*Vanda Hookeriana*). Later on we passed through swampy padangs, where the grass brushed our boat on each side and at dusk we stopped at the only bit of dry ground we could find to cook our supper and intended to spend the night there, but the mosquitoes were so bad that the boat men, although they had a long day's work, preferred to go on and work all night. Presently, however, we met the rising tide, which was so strong that we tied up to the bank for some hours and did not proceed till it turned again, when we slid easily down stream to Batu Pahat, which we reached about 5 a.m.

We remained at Batu Pahat for some days and took some observations from the hills, from which good views of Ophir, the Berembun group, Blumut, Pantie, Mintahak, and Pulai, were

obtained. While at Batu Pahat specimens of some good birds were obtained, including the small hornbill (*Anorrhinus galeritus*.) and the curious Timaline bird (*Eupetes macrocerus*). At the Batu at the mouth of the river, the rocks (granite) are covered in many places with orchids, the most conspicuous being the Spider Orchid (*Renanthera Maingayi*). Just outside the mouth of the river is a small rocky islet on which is a settlement of "Orang Laut," who live by fishing and making blachang. Their huts are built on the bare rock and look as if the first gale would blow them all away. On this islet is a piggery which might well be taken as a model by keepers of that useful animal. The stys are built on piles over the water and kept perfectly clean and sweet by being thoroughly washed out daily with sea water. The pigs are fed almost entirely on Sago refuse.

During the whole trip we had very wet and cloudy weather, which made collecting difficult and rendered almost hopeless any attempts at astronomical observations. From a natural history point of view the country is fairly interesting. The larger Mammals are not met with unless special search is made for them. Traces of Elephant, Tiger, Deer, and Pig were met with, but S'ladang do not appear to inhabit this part of Johor, at least we saw and heard nothing of them. Birds were fairly plentiful, but, as is usually the case in the Malayan jungles, had to be hunted for. Butterflies were scarce, very few being observed and only a very few captured.

Owing to the main object in view being the survey of the rivers, collecting had to be chiefly confined to the jungle immediately adjoining their banks and probably many places which did not prove very productive to us might yield a good harvest to a collector who could squat for a time and thoroughly rummage the neighbourhood. The Hulu Indau and the Kahang rivers looked more promising.

The Jakuns, or "Orang Hulu," as they prefer to be called, met with in the Indau and Sembrong districts are of two types, one with fine features and straight hair, and the other with thick negro features and curly, almost woolly, hair. These two types are met with intermixed in most of the villages, together with every gradation between the two. On the Mas river most of

the inhabitants were of the fine featured race, while at Kampong P'niot, on the Kahang, good examples of both extremes were observed. Their height is from four to five feet only but they are pretty well developed and capable of enduring a considerable amount of fatigue. The Sumpitan, or blow pipe, does not appear to be used in these districts, the only weapons being spears, b'liongs, and parangs, and S'rampangs for spearing fish. The Labu, a large pear shaped gourd about nine inches in diameter, is used as a vessel for holding water.

The houses of these interesting people are built on thin poles, ten or twelve feet high, near the bank of a river. The floors are of lantai, (split nibong) or split bamboo, over which are spread mats made of mengkuang; the roof and walls are of atap, Daun Payong (*Teysmannia altifrons*) or occasionally Kajang. I noticed one house at Kampong P'niot the walls of which were of bark. Two or more, up to as many as five or six families, live in one house, according to its size. The portions allotted to each family being not at all, or only partially screened off with mats, from each other. All cooking is done in the huts, the smoke escaping as best it can through the numerous interstices of the walls and roof. The fire place consists of an oblong frame work or shallow box of wood about thirty inches by eighteen inches and some four or five inches deep, filled with earth, on the top of which are placed three good sized stones to support the cooking pots. All the Jakuns, men and women, chew sirih and tobacco, of the latter they are especially fond. When they cannot obtain such leaf they use the bark of a root called "kallong" as a substitute. This root is slightly astringent and has somewhat the same flavour as sirih. Each man carries his supply of betelnut, sirih (or kauong), tobacco, and lime in a small wallet made of pandan and never goes anywhere without these—to a Jakun—almost 'necessaries of life.'

The clothing worn by both sexes is scanty, consisting for the men of a pair of loose short trousers or a sarong, and for the women of a sarong fastened at the waist. Some of them have adopted the Malay "baju," or loose jacket, and some wear the head cloth. Cats and dogs are found in all the villages, the former in every house and sometimes two or three in one house. They are of various colours, black, white, grey, or combinations

of these colours. The dog are mostly small with sharp noses and prick ears. Some are white and yellow, others black, or black and white.

Lists of the animals and plants collected or observed are appended.

H. J. K.

**List of Mammals collected (*) or observed
during trip.**

Hylobates albianus, Vig. Horsf.

The common black Wau Wau. This species was fairly plentiful everywhere on the Indau and Sembrong rivers. It always goes in small troops.

Macacus nemestrinus, Linn.

The 'Berok' was observed only on Gunong Janeng.

Macacus Cynomolgus, Schreb.

The Mangrove Monkey. Common in the low lands near the coast and up the rivers for a considerable distance.

**Semnopithecus obscurus*, Reid.

The Dusky Lotong. This species is very nearly black in Johor. Several specimens were obtained. Common everywhere in the inland districts.

Felis tigris, Linn.

Reported to be plentiful everywhere, especially on the Indau and at Batu Pahat.

Lutra leptonyx, Gray.

M. Knox, of Batu Pahat, shewed us the skin of an otter which had been shot close to his house.

Pteropus edulis, Gray.

I only saw a single specimen of this large fruit bat, at Kuala Kabang. It is probably common.

**Pteromys oral*, Tick.

Red flying squirrel. One specimen obtained at Simpai, on the Batu Pahat Sembrong.

**Sciurus bicolor*, Sparrm.

This squirrel, which is common in Johor, is here of a dirty yellowish white colour, somewhat darker on the back. Specimens were obtained at Kuala Sembrong and Batu Pahat.

Sciurus notatus, Bodd.

This pretty little squirrel is common everywhere.

Sciurus tenuis, Horsf.

Fairly common. The smallest of the Malayan squirrels.

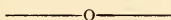
Elephas maximus, Lam.

The elephant appears to be common throughout Johor. Tracks were seen in many places on the Indau, and also on the Sembrong, near P'ngkalan Repoh especially.

Cervus equinus, Cuv.

Tracks of the Sambhur were seen on Gunong Janeng. This deer is probably common in the Johore jungles, but owing to its shy nature is seldom seen.

H. J. K.



List of Birds collected (*) or observed during trip across Johore.

Accipiter virgatus, Temm.

**Spizaetus caligatus* Raffl. Kuala Sembrong (Indau).

**Spilornis bacha*, Daud. Kuala Sembrong (Indau).

**Microhierax fringillarius*, Drap. Batu Pahat.

Corone macrorhyncha, Wagl. Kuala Indau.

Corone enca, Horsf.

Oriolus indicus, Jerd. Batu Pahat.

Dissemurus platurus, Vieill.

**Buchanga atra*, Herm. Kahang river.

**Rhipidura perlata*, S. Müll.

**Terpsiphone affinis*, Hay. Kuala Sembrong (Indau).

**Terpsiphone princeps*, Temm. Kuala Sembrong (Indau).

**Philetonoma pyrrhopterum*, Temm.

**Chloropsis osterops*, Vigors.

**Chl. icterocephala*, Less.

**Chl. cyanopogon*, Temm.

**Criniger phaeocephalus*, Hartl.

Pycnonotus analis, Horsf. Kuala Indau.

P. plumosus, Blyth.

Copsychus musicus, Raffl. Simpai, Batu Pahat, etc.

**Eupetes macrocercus*, Temm. Batu Pahat.

Turdinus abotti, Blyth.

**T. magnirostris*, Moore.

**Malacopteum magnum*, Eyton.

**M. affine*, Blyth.

**Miscornis gularis*, Raffl. Kuala Sembrong (Indau).

- **Macronus ptilosus*, Sard and Selb.
- Lanius cristatus*, Linn. Kuala Indau.
- **L. lucionensis*, Linn.
- Aethopyga siparaja*, Raffl. Batu Pahat.
- **Arachnothera affinis*, Horsf.
- Anthothreptes Malaccensis*, Scop. Batu Pahat, &c.
- **Chalcophana singalensis*, Gm.
- Prionochilus percussus*, Temm. Batu Pahat.
- **P. maculatus*, Temm.
- Hirundo javanica*, Sparrm. Batu Pahat, &c.
- Anthus rufulus*, Vieill. Batu Pahat, &c.
- Mainatus javanensis*, Osb. Kuala Indau.
- Calornis chalybea*, Horsf. Kuala Indau. Batu Pahat.
- Ca'lyptomena viridis*, Raffl. River Indau.
- **Corydon Sumatranus*, Raffl. Kahang river.
- **Cymborrhynchus macrorhynchus*, Gm.
- **Tachornis infumata*, Sch.
- **Macropteryx comatus*, Temm. Kahang river.
- **Lyncornis temminckii*, Gould. Kuala Kahang.
- **Eurystomus orientalis*, Linn. Kuala Sembrong (Indau).
- **Merops philippinus*, Linn. Batu Pahat.
- **Nyctiorhis amicta*, Temm.
- **Pelargopsis Malaccensis*, Sharpe. Sembrong rivers.
- Alcedo ispida*, Linn. On all the rivers.
- **A. Meninting*, Horsf. Cheh-Cheh.
- **Halcyon pileatus*, Bodd. Indau river.
- **Buceros rhinoceros*, Linn. Indau river, Batu Pahat &c.
- Anthracoceros convexus*, Temm. Indau river.
- **Anorrhinus galeritus*, Temm. Batu Pahat.
- **Harpactes kasumba*, Raffl. Kuala Kahang.
- **Harpactes durancetti*, Temm. Kuala Kahang.
- **Chrysophlegma humei*, Hargitt.
- **Gauropicoides rafflesi*, Vig. Kuala Madek.
- **Meiglyptes grammithorax*, Malh.
- **Meiglyptes tukki*, Less.
- **Thriponax javensis*, Horsf. Sembrong (Batu Pahat.)
- **Calorhamphus hayi*, Gray.
- **Cuculus striatus*, Drap.
- **Zanclostomus javanicus*, Horsf.
- **Rhopodites diardi*, Less.

Palaeornis longicauda, Bodd.

**Psittinus incertus*, Shaw. Sembrong river, &c.

**Osmotreron olax*, Temm.

Carpophaga aenea, Linn. Sembrong river, &c.

Pavo muticus, Linn. Kuala Sembrong (Indau).

Argus giganteus, Temm. Gunong Janeng.

Gallus ferrugineus, Gm. Kuala Sembrong (Indau.)

Gallinago sthenura, Kuhl. Kuala Indau.

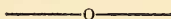
Numenius arquata, Linn. Batu Pahat.

Herodias garzetta, Linn. Batu Pahat.

Ardea Sumatrana, Raffl. Tanjong Tengarah.

**Butorides javanica*, Horsf. Sembrong and Indau rivers.

H. J. K.



Part II. Topography and Geology.

(a). THE INDAU RIVER.—

This river has been described in a previous number of this Journal; I will therefore only deal with two of its tributaries not previously explored, viz., the Mas and the Lëman rivers.

SUNGEI MAS.—

The source of this river lies in some low hills to the west of the Indau; the stream, after pursuing a E. N. E. course, empties itself into the upper Indau, eleven miles above Kuala Sembrong. Total length of river about twenty-five miles.

The Mas is very shallow and can only be ascended in small canoes. Six and a half miles up stream there is a Jakun village consisting of three large huts with about twenty-five inhabitants under a Jeroh Kerah. Two and a half miles further there is a larger settlement of fifty to sixty people, under a Batin. Most of the aborigines are engaged in rotan and getah collecting, they also plant tapioca and Indian corn (jagong)

There were *several* cases of leprosy here.

SUNGEI LEMAKAN.—

This a small river having its source amongst the southern spurs of Mount Janeng; its general course is north easterly. Total length about nine miles. It joins the Upper Indau

twenty-four miles above Kuala Sembrong. The stream is shallow and sandy, the banks are high and consist of clays and clay shales. At the Kuala there is a large clearing, occupied by about forty Jakuns; these people lived formerly at Batu Gajah, a few miles further up the Indau. They plant padi at Lēmaku, but are chiefly engaged in collecting jungle produce. They appear to be a very thrifty and hard-working people.

(b.) THE INDAU SEMBRONG RIVER.—

This river is a tributary of the Indau, joining it at a distance of thirty miles from the China Sea, in Lat. $2^{\circ} 25' 50''$ N. and Long. $103^{\circ} 36' 45''$ E.

At the mouth the Indau Sembrong is about seventy-five yards wide. There is a Johore Government Station and a few Malay houses. There are some extensive clearings on the right bank, where the Penghulu of the district lives; several families from Pahang have lately settled here. At one and three quarter miles up stream the Linggor, a large tributary, flows in on the right bank; the course of this stream is north westerly, the mouth is about twenty-five yards wide, the stream sluggish, but deep, and the banks low and swampy. The source of the Linggor is said to be to the South, in the Blumut range. Ten miles from the mouth there is a small Jakun settlement.

Kuala Kahang is about twenty-four miles further up stream. This river is described in section (d)

A large steam launch could run up as far as Kuala Kahang, the river being wide, deep, and tidal. Beyond this point, however, it narrows very considerably owing, in a great measure to the stream splitting up into a number of small channels; the chief of these is known as Harus Dras, and forms a loop nearly five miles long.

At Sungei Selieh the river widens again. The Selieh is a stream flowing from the south; the source is about two days journey inland. At the Kuala there is a small Jakun village with twenty-five inhabitants; from here a path leads to Hulu Kahang, one day's journey.

Beyond Selieh the river becomes very narrow, then suddenly opens out into a series of lagoons connected by narrow channels overgrown with "rasau." In the midst of these lagoons rise the two hills "Parit" and "Jakas," each about 400 feet high. The surrounding country is very swampy.

Sungei Sēlai is a large tributary stream, joining the main river fourteen and a half miles above Kuala Kahang. The source is in Gunong Sēlai, in the Tenang Hills; the course is southerly; the river is navigable by large canoes for over two thirds of its length. Near the source is a Jakun village of some fifty inhabitants, with a "Batin," who is under the Penghulu of Batu Pahat. From this village a path leads to the Bekok river, three days' journey.

Kuala Sungei Tamok is a little beyond Kuala Sēlai; it is a small stream flowing from the north. Near the Kuala is a settlement of some fifty Jakuns.

At Pengkalan Panau, on the right bank of the Sembrong, twenty miles from the Kuala Kahang, there is a Chinese trader and a few Malays; near this place also is the Jakun settlement of Umbong, consisting of five huts on a large clearing. Beyond this the river winds through swampy country until Londang is reached, forty seven miles above the Government station at Kuala Sembrong; here the Penghulu of the districts, Che Ma'Dagang, lives, with a few Malays.

(c.) THE SOURCE OF THE INDAU AND BATU PAHAT SEMBRONGS.—

A short distance beyond the village of Londang the Sembrong loses its individuality entirely; two streams, the Paloh and Mēlētir, uniting to form the main river.

The source of the Paloh lies about one and a half days' journey to the north westward, towards the Bekok river.

The Mēlētir rises in a small hill a few miles south west of Pengkalan Repoh; from this last named spot a path leads over flat country to the Jakun village of Simpai, on the Batu Pahat Sembrong, a distance of five and a half miles.

At two miles from Pengkalan Repoh the Panggong, a small stream rising in a swamp to the south east, bifurcates, one half meandering through a swamp and eventually draining into the Mēlētir, by a number of small channels; the other half, called by the Jakuns the Kēlambu, flows briskly south westward, uniting with the Simpai stream to form the Batu Pahat Sembrong.

Theoretically, therefore, the two Sembrongs have a common source, and the southern portion of Johore Territory is an island. Practically, however, the Panggong contributes a very small pro-

portion to the volume of the Indau Sembrong, being only a minor tributary of the Mēlētir.

As regards the Batu Pahat Sembrong the Panggong plays a more important part, as, with the Sempai stream, it forms the actual source of that river.

The country from Londang to the Kēlambu is exceedingly swampy, with here and there a little solid, but not hilly, ground. It is uninhabited save by wandering parties of Jakuns.

The Mēlētir is navigable, with difficulty, by moderately large canoes, as far as Repoh; the Kēlambu is not navigable above the Simpai junction. A little deepening and clearing of fallen timber would, however, render both these rivers easily navigable, so that a shallow canal of about one and a half miles in length through soft, flat country, would connect the two Sembrongs and form a continuous waterway for canoes from the China sea to the Straits of Malacca, a river distance of about 150 miles.

The railway trace runs across this swampy country.

(d.) THE KAHANG RIVER.—

This river, the largest tributary of the Indau Sembrong, takes its rise at the foot of Gunong Bechuak, in the Blumut range. It pursues a north, north easterly course, and empties itself into the Sembrong twenty-four miles above the mouth of that river. At the Kuala the Kahang is about twenty yards wide. For fifteen or twenty miles the river is fairly free from obstructions in the shape of fallen timber and shallows; past this point, however, it is navigable only by small canoes.

Near Kuala Kahang is a mixed Dyak and Jakun village, in a clearing on the right bank; the Dyaks, about ten in number, came in from Sarawak some years ago, they are engaged in planting padi and collecting jungle produce. Four miles above the Kuala the Madik river joins the main stream; this river rises in some low hills distant about twenty-five miles to the south its banks are at present uninhabited. Small canoes can go up almost to the source, from whence a path leads to the Johore river.

Two miles above Kuala Madik is a Jakun village called P'niot; here are eight or nine huts with about forty inhabitants. The Kahang is much frequented by Jakun and Malay rotan collectors; the rotan although very abundant is not of first quality.

Camphor trees are found in the neighbourhood of Bukit Běbap near the Hulu (*i. e.* source). Gutta is also fairly plentiful.

The geology of the Kahang is very similar to that of the Seriting and Gemeh rivers—a country of clays and clay shales, with here and there traces of a sandstone formation lying in almost horizontal strata about eight feet below the clays. Besides this sandstone there are a few out-cropping masses of a very hard compact green quartzite felsite.

I found no traces of alluvial gold or of tin ore here.

(*e.*) THE SEMBRONG BATU PAHAT.—

Under this section I propose dealing with the upper portion only of the Sembang Kanan or right fork of the Batu Pahat river, usually known as the Batu Pahat Sembrong.

The Sempang Kiri, or left fork, and the Bekok, a big tributary of the right fork, are thickly settled with Chinese engaged in gambir and pepper cultivation. This country was surveyed by the Datu Luar of Johore some time ago.

As before stated, the Batu Pahat Sembrong is formed by the junction of the Simpai and the Kělamu (Panggong). A little below this junction is the Jakun village of Simpai, numbering about thirty-five inhabitants; below this in close succession along the banks of the river come the villages of Rukam, Merepoh, and Cheh-Cheh, all inhabited by Jakuns, the two former with about seventy-five and fifty people respectively.

There is a Chinese gambir plantation near Rukam. At Cheh-Cheh, which is about four miles below Simpai, are three or four Malay and a Chinese trader, with some thirty to forty Jakuns. Cheh-Cheh is the centre of the rotan trade.

Beyond Cheh-Cheh the stream winds through miles of swamp, with here and there patches of high ground taken up by Chinese gambir and pepper planters, with occasionally large “Kankars” or Chinese villages, each inhabited by several hundred men. The river, although deep and navigable by large sampans and canoes, is very narrow until Kuala Bekok is reached, a distance of about twenty miles from Simpai; from thence to Kuala Batu Pahat (seventeen miles further) trading steamers ply daily.

(*f.*) THE BATU PAHAT HILLS.—

This small group of hills lies on the east side of the Batu Pahat river, close to the Kuala.

Mount Formosa is the principal elevation, about 1400 feet above sea level ; it forms a prominent land mark for sailors north east of it ; and distant about one mile is Gunung Penggaram, about 1150 feet high. From the summit of Penggaram, Mount Ophir, Blumut, and Pulai are distinctly visible ; seawards the country is flat with much mangrove swamp.

On the slopes of Formosa and Penggaram are several coffee estates, under European management. A cart road leads to Pengkalan Penggaram on the river.

Geology of the Batu Pahat Hills.—The bed rock is a very hard fine-grained granite, which crops out here and there on the hill side, is overlaid by the usual clays and clay shales.

There is a little alluvial tin ore in the valley between Formosa and Penggaram ; this was formerly worked by Chinese, but is now abandoned ; it is of little importance at present.

HARRY LAKE,

Johore, December 22nd, 1892.

List of plants collected.

Menispermaceæ.

Fibraurea chloroleuca, Miers. Sungei, Hulu Sembrong.

Limacia Kunstleri, King. Kuala Sembrong.

Dilleniaceæ.

Wormia suffruticosa, Griff. Kwala Sedili Besar.

Anonaceæ.

Goniotalamus macrophyllus, Hook. Simpai, Ulu Batu Pahat, and Gunong Janeng, where it is called "Sajur Wah."

G. giganteus, Hook. "Galang Hutan," at Kwala Sembrong.

Polyalthia Beccarii, King. "Buah Lara Merak." Kwala Sembrong. "Lara" is a common Malay name for many species of anonaceous plants.

Unona discolor, Vahl. "Akar Darah." Kwala Sembrong.

U. dasymaschala, Bl. Tanah Abang, Gunong Janeng, and Kwala Sembrong.

Popowia nervifolia, Maing. "Pasa Achong." Gunong Janeng.

Mitrephora macrophylla, Oliver. Kwala Kahang.

Nympheaceæ.

Barclaya Motleyana, Hook. "Daun Kalapa," at Sungei Malitil. This very curious jungle water lily seems by no means uncommon. It grows in shallow streams in the denser parts of the forest, mixed up with an aquatic aroid, *Cryptocoryne*, sp, which it so much resembles when out of flower that it is very easily overlooked. The flowers are dull reddish and not at all conspicuous.

Violaceæ.

Neckia humilis, Hook. Gunong Janeng. I have recently met with this on Gunong Panti, also growing on banks at about 2,000 feet altitude.

Alsodeia Kunstleriana, King. Gunong Janeng.

A. Scortechinii, King. Simpai Hulu Batu Pahat.

Bixineæ.

Flacourtia Rukam, Zoll and Mor. Kuala Sembrong. This is the broad-leaved wild Rukam tree, the species commonly known here as Rukum is *F. Cataphracta*, Roxb, which I have never seen really wild.

Pittosporeæ.

Pittosporum ferrugineum, Ait. Hulu Batu Pahat.

Polygaleæ.

Salomonina aphylla, Griff. Batu Pahat.

Guttiferæ.

Calophyllum Wallichianum, Planch. Kwala Sembrong.

Kayea eugeniiifolia, Pierre? Kwala Sembrong.

Ternstroemiaceæ.

Gordonia excelsa, Br. Kwala Kahang.

Adinandra acuminata, Korth. Kampong Chin-chin.

Sterculiaceæ.

Commersonia platyphylla, Andr. Kwala Sembrong.

Tiliaceæ.

Elæocarpus paniculatus, Wall. Kwala Sembrong, Hulu Sembrong.

E. robustus, Roxb. Sungei Kahang.

Dipterocarpeæ.

Vatica, sp. A species with very small white flowers. Kwala Sembrong.

Pachynocarpus Wallichii, King. "Petaling Ayer," "Medang Pasir," Kwala Sembrong.

Rutaceæ.

Glycosmis sapindoides, Lindl. Bukit Murdom.

Gl. sp., near *pentaphylla*, but with much larger leaves. Flowers white and pink. Kwala Sembrong.

Luvunga scandens, Ham. "Buah Keping Akar," Sungei Sembrong,

Atalantia monophylla, Corr. Kwala Batu Pahat.

Ochnaceæ.

Gomphia sumatrana, Jack. Kwala Batu Pahat.

Meliaceæ.

Chisocheton penduliflorus, Planch. Simpai.

Aglaiia paniculata, Hiern. Simpai.

A. minutiflora, Bedd. Bukit Tana Abang.

Olacineæ.

Gomphandra, sp. Simpai, Kwala Sembrong.

Ctenolophon parvifolius, Oliver. Hulu Batu Pahat.

Sapindaceæ.

Erioglossum edule, Bl. "Poko Kelat." Kwala Batu Pahat.

Ampelideæ.

Cissus diffusa, Planch. Kwala Kahang.

Pterisanthes caudigera, Miq. Hulu Sembrong.

Anacardiaceæ.

Buchanania acuminata, Turcz. Hulu Kahang.

Connaraceæ.

Rourea fulgens, Wall. Kwala Kahang.

Connarus grandis, Jack. "Akar Chin-Chin." Hulu Sembrong

Leguminosæ.

Millettia sericea, Warn. "Akar Mumboll." Kwala Sembrong

Uraria crinita, Desv. "Pua Acoraging." Kwala Sembrong

Pithecolobium contortum, Mart. Bukit Murden.

P. sp. Not in the Flora of British India. Kwala Sembrong; used for making soap.

P. fasciculatum, Benth. "Kachang Tupai." Kwala Sembrong.

Myrtaceæ.

Eugenia Zeylanica, Wight. Kwala Sembrong.

E. leptantha var? A variety apparently of this species, with very thick leaves. Gunong Janeng.

Barringtonia acutangula, Gaertn. Kwala Sembrong.

Melastomaceæ.

Senerila heterophylla, Jack. Simpai.

S. sp. nov. Gunong Janeng.

Blastus borneensis, Cogn. Gunong Janeng.

Allomorphia near Griffithii, "Kakapal Umu." Gunong Janeng.

Marumia verrucosa, Cogn. "Akar Salan Hutan." Kwala Sembrong.

M. nemorosa, Blume. Kwala Sembrong.

Memecylon coeruleum, Jack. Hulu Sedili.

Medinilla rubicunda, Bl. Kwala Kahang.

Pternandra, sp. Kwala Kahang.

Phyllagathis rotundifolia, Miq. Simpai.

Rhizophoreæ.

Carallia integerrima, Del. "Merpain" Hulu Kahang.

Saxifragaceæ.

Polyosma, sp. Hulu Kahang.

Samydaceæ.

Homalium sp. "Mensarah putih" Poko Ayer Anjing.

Kwala Sembrong; Ulu Kahang.

Cucurbitaceæ.

Trichosanthes celebica, Cogn. Apparently this species, which has only hitherto been met with in Celebes. Bukit Murdom.

Araliaceæ.

Aralidium pinneatifidum, Miq. Bukit Murdom.

Rubiaceæ.

Sarcocephalus subditus, Miq. "Sakir Damat" Gunong Janeng.

Argostemma ophirens, C. B. C. Gunong Janeng.

A. spinulosum, C. B. C. ? Gunong Janeng.

Hedyotis congesta, Br. Kwala Sembrong.

H. sp. A scandent herb. Kwala Batu Pahat.

Gardenia tubifera, Wall. "Koping Ayer." Kwala Sembrong.

G. tentaculifera, Hook. Hulu Kahang.

Urophyllum hirsutum, Bl. Simpai.

Lucinea morinda, Jack. Simpai.

Randia fasciculata, D. and C. "Akar Duri." Kwala Kahang.

Canthium dilymum, Miq. Bukit Tana Abang.

Diplospora, sp. Kwala Kahang.

Ixora parviflora, Vahl? Gunong Janeng.

I. pendula, Jack. "Saratong Padi." Kwala Sembrong.

I. fulgens, Roxb. Kwala Kahang.

Lecananthus erubescens, Jack. "Poko Datoh Rajah" Sungei Malitil.

Prismatomeris albidiflora, Thw. Kwala Batu Pahat.

Psychotria Helferiana, Kurz. Simpai.

P. polycarpa, Miq. Kwala Sembrong.

P. sarmentosa, Blume. Kwala Kahang.

Chasalia curviflora, Thw. Kwala Kahang, Kwala Sembrong.

Poederia foetida, L. Sungei Hulu Sembrong.

Cephaelis Griffithii, Hook. Hulu Sembrong.

Compositæ.

Vernonia scandens, L. Bukit Murdom.

Myrsineæ.

Moesa ramentacea, L. Bukit Murdom.

M. indica, L. Kwala Batu Pahat.

Ardisia villosa, Roxb. Simpai.

A. colorata, Roxb. Kwala Kahang.

A. colorata, var? With the panicle, petioles, branches and back of leaves covered with a red tomentum. Simpai, Hulu Batu Pahat.

A. crassa, C. B. Clarke. Sungei Hulu Sembrong.

A. sp. Apparently undescribed; with ovate petioled serrate leaves, and large pink fruits. Flowers not seen. Gunong Janeng. (I also collected this on Gunong Panti.)

Loganiaceæ.

Fagrea racemosa, Jack. Kwala Sembrong.

Oleaceæ.

Olea maritima, Wall. Kwala Batu Pahat.

Jasminum subtripplinerve, Bl. Kwala Kahang, Kwala Sembrong.

J. pubescens, Bl. Kwala Sembrong.

Apocynaceæ.

Tabernæmontana malaccensis, Hook. Simpai.

Kopsia, sp. Kwala Kahang. (The same species that occurs in Singapore.)

Kopsia, sp. with sessile leaves. Kwala Kahang.

K. near *K. arborea*, "Bankoo." Sungei Hulu Sembrong.

Asclepiadeæ.

Tylophora tenuis, Bl. "Akar Saput Tungal." Sungei Hulu Sembrong.

Hoya coronaria, Bl. Sungei Hulu Sembrong.

Dischidia hirsuta, Bl. Kwala Kahang.

Cyrtandreeæ.

Didymocarpus platypus, C. B. Clarke. Bukit Murdom, Simpai.

D. heterophylla, Ridl? Gunong Janeng.

D. sp. Gunong Janeng.

Cyrtandra, sp. Bukit Tanah Abang.

Aeschynanthus Wallichii, Lindl. Simpai.

Solanaceæ.

Solanum nigrum, L. "Trong Parachichit" Bukit Murdom.

Convolvulaceæ.

Erycibe Princei, Hook. "Akar Sakijang." Kwala Sembrong.

Lettsonia maingayi, Hook. Kampong Chin-Chin, Ulu Batu Pahat.

Boragineæ.

Tournefortia Wallichii, Dec. Bukit Murdom.

Acanthaceæ.

Lepidagathis longifolia, Wight. Kampong Chin-Chin.

Ebermaiera. Near *E. longifolia*, but differing in its broader

leaves and less hairy bracts. Gunong Janeng. (I collected this on the Tahan river, Pahang).

Justicia gendarusa, L. Simpai.

Hemigraphis confinis, Anderss. Kwala Kahang

Rungia, sp. Kwala Sembrong.

Scrophularineæ.

Ilysanthes hyssopioides, Benth. Kwala Kahang.

Verbenaceæ.

Clerodendrum, sp. This is near *C. fistulosum*, Becc, a Bornean plant, with white flowers, remarkable for having (as this species also has) the stem swollen between the joints and inhabited by ants. This species differs in having orange-red flowers arranged in a raceme, and petioled leaves. Kampong Chin-Chin. (I met with this once in a wood at Choa Chu Kang in Singapore.)

Labiatae.

Dysophylla auricularia, L. Kwala Kahang.

Aristolochiaceæ.

Thottea grandiflora, Rottb. Bukit Murdom.

Piperaceæ.

Piper stylosum, Miq. Simpai.

P. caninum, L. Kwala Sembrong.

Myristicaceæ.

Myristica Missionis, Heyne. Chin-Chin, Kwala Sembrong.

M. oblongifolia, King. Bukit Tana Abang.

Laurineæ.

Cryptocarya Griffithiana, Hook. Simpai.

Proteaceæ.

Helicia robusta, Wall. "Putat Topi." Bukit Tana Abang.

Loranthaceæ.

Loranthus retusus, Jack. Bukit Murdom.

L. formosus, Bl. Sungei Hulu Sebrong.

Santalaceæ.

Champerea Griffithiana, Planch. Simpai, Kampong Chin-Chin.

Euphorbiaceæ.

Breynia coronata, Hook. "Hujan Panas." Kwala Kahang.

Antidesma fallax, Muel Arg. Kwala Sembrong.

A. moritzii, Muell. Kwala Sembrong.

A. near salicifolia, "Wampana." Gunong Janeng.

Baccaurea parviflora, Muell. Simpai.

Aleurites moluccana, Forst. "Buah Keras Laut," Kampong Chin Chin.

Galearia affinis, Br. "Rambe Daun." Gunong Janeng, Kwala Sembrong.

G. pedicellata, Br. "Penurun Lutong." Gunong Janeng.

Macaranga, sp. "Mahang Merah." Sungei Hulu Sembrong.

Aporosa aurea, Hook. Gunong Janeng.

Croton Griffithii, Muell. Bukit Murdom.

Urticæ.

Pouzolzia pentandra, Benn. Kwala Kahang.

Conocephalus scortehinii, King. Kwala Sila, Hulu Sembrong.

Gironniera nervosa. Kwala Sembrong.

G. costata, Miq? Simpai.

Cupaliferae.

Quercus sundaica, Bl. Kwala Sembrong.

Gnetaceæ.

Gnetum funiculare, Bl. Kwala Sembrong and Kwala Batu Pahat.

Orchideæ.

Oberonia, sp. Apparently new. Hulu Sembrong.

Liparis disticha, Lindl. Kwala Kahang.

Dendrobium (§ *aporum*) *Leonis*, Rehb. Bukit Murdom.

„ *grande*, Hook. Kwala Sembrong.

carnosum, Lindl. Kwala Kahang.

D. (strongyle) subteres, Lindl. Kwala Kahang, Kwala Sembrong.

D. pumilum, Rehb. Kwala Sembrong.

D. crumenatum, Lindl. Kwala Batu Pahat. A form with the flowers tinted red.

Cirrhopetalum, sp. nov. Batu Pahat (I have this from the islands south of Singapore).

C. Gamosepalum, Griff. Sungei Kahang

Bulbophyllum, sp. Kampong Simpai, Kampong Chin-Chin, and Sungei Malitil. I have this also from Borneo, where it was collected by Dr. Haviland.

B. vermiculare, Hook. Kwala Kahang.

B. concinnum, Hook. Sungei Kahang.

Claderia viridiflora, Hook. Simpai.

Eria nutans, Lindl. Kampong Simpai.

E. pulchella, Lindl. Kwala Kahang, Kwala Sembrong.

- Cælogyne macrobulbon*, Hook. Gunong Janeng.
Plocoglottis javanica, Bl. Simpai.
P. porphyrophyllus, Ridl. Kwala Kahang.
Arundina densa, Lindl. Gunong Janeng.
Bromheadia palustris, Lindl. Kwala Batu Pahat.
Eulophia squalida, Lindl. Batu Pahat.
 graminea, Lindl. "Kaling Lilin" Bukit Murdom.
Vanda Hookeræ, Lindl. Kwala Batu Pahat.
Renanthera maingayi, Hook. Batu Pahat.
R. micrantha, Lindl. Batu Pahat.
Phalœnopsis sumatrana, Teysm. Kwala Sembrong.
Sarcophilus calceolus, Lindl. Batu Pahat.
Appendicula callosa, Lindl. Kwala Kahang.
Acriopsis javanica, Bl. Bukit Murdom.
Thelasis capitata, Bl. Simpai.
Galeola altissima, Rehb. Bukit Murdom.
 Hydra, Rehb. Gunong Janeng.
Lecanorchis Malaccensis, Ridl. Bukit Tana Abang.
Apostasia nuda, Lindl. Bukit Murdom.

Scitamineæ.

- Alpinia Rafflesiana*, Wall. Simpai.
A. conchigera, Griff. Kwala Sembrong.
Koempferia tillandsioides, Bak. Kwala Sembrong.
Gastrochilus bilobus, Ridl. "Napus Papa." Gunong Janeng.
Globba, sp. Kwala Sembrong.
Zingiber Griffithii, Bak. Bukit Tanah Abang. Gunong Janeng.
Clinogyne grandis, Benth. Sungei Hulu Sembrong.
Canna indica, L. "Ganjong." Sungei Hulu Sembrong.

Burmanniaceæ.

- Thismia*, sp. Batu Pahat.
Gymnosiphon borneense, Becc. Batu Pahat.

Dioscoreaceæ.

- Dioscorea pyrifolia*, Kunth. Ulu Kahang.

Liliaceæ.

- Dianella revoluta*, Endl. Gunong Janeng.
Dracoena, sp. Ulu Kahang.
D. aurantiaca, Wall. Batu Pahat.

Pandananaceæ.

- Pandanus Russow*, Miq. River banks.

Aroideæ.

- Aglaonema nitidum*, Schott. Gunong Janeng.
Anadendron montanum, Schott. Bukit Tana Abang.
Alocasia longiloba, Miq. "Keladi Rimau." Bukit Murdom.
Scindapsus, sp. Chin-Chin.
Cryptocoryne, sp. Simpai.

Palmæ.

- Pinanga disticha*, Bl. Batu Pahat.
P. subruminata, Becc. Bukit Tana Abang.
P. sp. Kwala Sembrong.

Eriocaulæ.

- Eriocaulon wallichii*, Lindl. Gunong Janeng. A curious form with many leafy bulbils in the heads.

Cyperaceæ.

- Mariscus umbellatus*, Benth. "Mendarong Ekor Tupai," Kwala Sembrong.
Pandanophyllum multispicatum, Bekler. Kwala Sembrong.
Hypolytrum latifolium, Rich. Kwala Sembrong.
Manipia hypolytroides, Benth. "Pandan Biru", (also known as Umbai). Kwala Sembrong. This plant is used in mat-making in Malacca.
Gahnia Javanica, Zoll. Bukit Murdom.
Scleria malaccensis, Bekler. Kwala Sembrong.
loevis, Willd. Kwala Sembrong.
lithosperma, Nees. Kwala Batu Pahat.
Carex indica, L. Kwala Sembrong.

Gramineæ.

- Panicum auritum*, Presl. "Gumpai." Kwala Sembrong.
P. myosuroides, R. Be. "Rumput Bijan." Kwala Kahang, Kwala Sembrong.
P. colonum, L. Kaling, Bukit Murdom.
P. Ridleyi, Hack. Kwala Kahang.
P. radicans, Retz. "Upat." Kwala Kahang.
P. luzonense, Presl. Kwala Sembrong.
Isachne australis, Beauv. Bukit Murdom.
Pogonatherum polystachyum, Beauv. Kwala Kahang.
Leptaspis urceolata, Beauv. Kwala Sembrong.
Phragmites roxburghii, K. Bukit Murdom.